

IN THE CLAIMS:

The listing of claims will replace all prior versions of claims in the application. Please note that the claim listing includes current amendments to claim 2 and the cancellation of claims 1 and 10.

1. (Cancelled).

2. (Currently Amended) ~~The disk drive according to claim 1, further~~ A disk drive having a perpendicular magnetic recording system and a head that performs read and write operations in accordance with the perpendicular magnetic recording system, said disk drive comprising:

a disk medium including a magnetized area corresponding to data recorded with the perpendicular magnetic recording system and the head and a servo area in which servo data encoded with DC free code is recorded, the servo data being used to control a position of the head;

a decoding unit configured to decode the servo data;

a read channel configured to conduct signal processing of a read signal read with said head from said servo area of said disk medium;

wherein said read channel extracts the read signal whose level changes depending upon the magnetization transfer position of said magnetized area and has a predetermined low cut-off frequency f_c characteristic for eliminating low frequency component of the read signal, and

wherein the low cut-off frequency f_c is predetermined by the relationship:

$$T_{min} \leq (-\ln N)/2\pi f_c$$

where T_{min} is a minimum magnetization reverse interval time of said DC free coded servo data and N is a constant based on a read error rate of servo data.

3. (Cancelled).

4. *(Previously Presented)* A disk drive having a perpendicular magnetic recording system, a disk medium on which a magnetized area corresponding to data recorded on said perpendicular magnetic recording system is formed in a perpendicular direction with respect to a medium surface, and a head configured to perform read and write operation of the data with respect to said disk medium, said disk drive comprising:

a read channel having a predetermined cut-off frequency characteristics f_c that eliminates low frequency component of a read signal for extracting a read signal waveform whose level changes at a magnetization transfer position of the magnetized area from the read signal read with said head from said disk medium;

wherein said disk medium includes a servo area in which servo data is recorded, said servo data being used to control position of said head, said recorded servo data comprising coded data in which the sum total of the length in the longitudinal direction of the area having a positive polarity of said magnetized area and the sum total of the length in the longitudinal direction of the area having a negative polarity become equal to each other; and

wherein said read channel extracts the read signal whose level changes depending upon the magnetization transfer position of said magnetized area and has a predetermined cut-off frequency f_c characteristics to eliminate low frequency component of a read signal which is predetermined by the relationship:

$$T_{min} \leq (-\ln N)/2\pi f_c,$$

where T_{min} is minimum magnetization reverse interval time of said coded servo data on the servo area and N is a constant based on a read error rate of servo data.

5. – 6. *(Cancelled)*.

7. *(Previously Presented)* A disk drive having a perpendicular magnetic recording system, a disk medium on which a magnetized area corresponding to data recorded on said perpendicular magnetic recording system is formed in a perpendicular direction with respect to the medium surface, and a head configured to perform read and write operations of the data with respect to said medium, said disk drive comprising:

a read channel having a predetermined cut-off frequency characteristics f_c for extracting a read signal waveform whose level changes at a magnetization transfer position of the magnetization area from the read signal read with said head from said disk medium;

wherein said disk medium has a servo area in which servo data is recorded, said servo data being used to control position of said head, the recorded servo data comprising coded data in which the minimum magnetization reverse interval time T_{min} of said magnetized area satisfies the following condition:

$$T_{min} \leq (-\ln N)/2\pi f_c,$$

wherein f_c is a predetermined cut-off frequency of said read channel for eliminating low frequency component of a read signal and N is a constant based on a read error rate of servo data.

8. *(Previously Presented)* The disk drive according to claim 7, wherein the data comprising coded data satisfying said T_{min} condition has the constant N set to 0.5 or more.

9. – 10. *(Cancelled).*

11. *(Previously Presented)* A method of recording coded servo data in a disk drive having a disk medium, a head, and a read channel, the method comprising:

providing the read channel with a predetermined cut-off frequency f_c to eliminate low frequency component of a read signal;

configuring the read signal to extract a read signal waveform having levels that change at a magnetization transfer position located in a magnetization area of said disk medium;

encoding, via the read channel, the servo data used in the positioning control of the head to coded data in which the minimum magnetized area satisfies the condition of $T_{min} \leq (-\ln N)/2\pi f_c$, wherein f_c is a predetermined cut-off frequency of said read channel for eliminating low frequency component of a read signal and N is a constant based on a read error rate of servo data; and

performing, via the read channel, the perpendicular magnetic recording of the servo data in the servo area on the disk medium.